IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of :

Yoshifumi NAGAI et al. : **Attn: BOX PCT**

Serial No. NEW : **Docket No. 2002_0386A**

Filed March 19, 2002 :

THE COMMISSIONER IS AUTHORIZED
O CHARGE ANY DEFICIENCY IN THE
ES FOR THIS PAPER TO DEPOSIT
OUNT NO. 23-0975

DISPLAY APPARATUS, DISPLAY DRIVING CIRCUIT AND METHOD FOR DRIVING A DISPLAY
[Corresponding to PCT/JP01/06515
Filed July 27, 2001]

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents,
Washington, DC 20231

Sir:

Prior to initial examination of the above-identified application, kindly amend the application as follows:

IN THE CLAIMS:

Kindly amend the following claims:

3.(Amended) The display apparatus **according to claim 1**, wherein the horizontal driving section (3) stores a common ID to be received commonly for all of the horizontal sections (3) and the individual ID added individually to each of the horizontal sections (3) as identification information (23) to judge whether to perform a receiving process for the transferred data packet (20).

4.(Amended) The display apparatus **according to claim 1**, wherein:

the horizontal driving communicating section (8) has a receiving section (28) performing receiving process and an output selecting circuit (30) outputting the various control data input into the horizontal driving communicating section (8) and data input from the receiving section (28) selectively, outputs the control field (21) of the input data packet (20) transparently from the output selecting circuit (30), and outputs the information field (22) with replacing for a predetermined data packet (20).

7.(Amended) The display apparatus **according to claim 1**, wherein:

the horizontal driving communicating section (8) of the horizontal driving section (3) can output only in one direction; and

the output data from the horizontal driving communicating section (8) connected at end position of the lowest stream in data transferring direction in a plurality of the horizontal driving position (3) connected serially is input to the second communicating section (6) of the driving control section (4).

8.(Amended) The display apparatus **according to claim 1**, wherein:

the driving control section (4) or the horizontal driving section (3) has a first reference clock generating section (7) generating first reference clock to control lighting gradation; and

the horizontal driving section (3) further has a lighting control section (15) controlling lighting gradation based on reference clock, a second reference clock generating section (19) generating second reference clock synchronizing the various control data input from the driving control section (4), a reference clock selecting circuit (36), which is input the first reference clock and the second reference clock, and selects the first reference clock or the second reference clock alternatively to output as reference clock to control lighting gradation.

10.(Amended) The display apparatus **according to claim 5**, wherein:

the horizontal driving section (3) has a third counter (40) counting input of the first reference clock and retaining predetermined data when count number of the input first reference data becomes a predetermined value, and clearing the count number of the first reference clock when the horizontal driving communicating section (8) receives a frame start packet denoting frame synchronizing;

the disturbance data retaining section (29) retains data denoting occurrence of disturbance of the first reference clock, when count number of the third counter is less than the predetermined value; and

the driving control section (4) reads the data denoting an occurrence of disturbance of the first reference clock by the disturbance data reading packet (20B), controls the reference clock selecting circuit (36) of the horizontal driving section (3)

occurring the disturbance to select from the first reference clock to the second reference clock by the data packet (20).

12.(Amended) The display apparatus **according to claim 1**, further comprising:

a substrate is integrated with a lighting element board (41) disposing the lighting elements (11) and a driving circuit board (42) having driving circuits (10) driving the lighting elements (11), and

wherein the driving circuits (10) are disposed between the lighting elements.

19.(Amended) The display apparatus **according to claim 13**, wherein:

the display section is constituted by a plurality of indicating blocks (10) divided into m rows X n columns (m, n are integer and two or more) areas;

the horizontal driving sections (3) are connected from the second communicating section (6) side one after another toward horizontal direction serially; and

the horizontal driving section (3) connected at end column of the lowest stream in each row is connected with the horizontal driving section (3) of the same column in next row.

20.(Amended) The display apparatus according to claim 13, wherein:

the horizontal driving section (3) judges whether to perform a receiving process against the transferred data packets based on the identification information (23) added to the data packets or not, by storing an individual ID (23A), which is added to each horizontal driving section (3) individually, to the horizontal driving side identification information storing section (29); and

the horizontal driving section (3) stores a common ID (23B) to be received by all of the horizontal driving sections (3) commonly.

21.(Amended) The display apparatus according to claim 1, wherein a plurality of the lighting elements (11) are disposed in a matrix shape in the display section (1).

22.(Amended) The display apparatus according to claim 1, wherein the control data is image data for image-displaying.

23.(Amended) The display apparatus according to claim 1, wherein the control data is illuminating data for an illumination.

REMARKS

The present Preliminary Amendment is submitted to delete the multiple dependencies of claims 3-4, 7-8, 10, 12, and 19-23, thereby reducing the required PTO filing fee.

Copies of the amended portion of the claims with changes marked therein is attached and entitled "*Version with Markings to Show Changes Made.*"

Respectfully submitted,

Yoshifumi NAGAI et al.

By _____
Michael S. Huppert
Registration No. 40,268
Attorney for Applicants

MSH/kjf
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
March 19, 2002

Version with Markings to Show Changes Made

the horizontal driving sections (3); and

the horizontal driving communicating section (8) performs a lighting control of the lighting elements (11).

2. A display apparatus comprising:

a display section (1) disposing a plurality of lighting elements (11);

a vertical driving section (2) driving each row of the display section (1) selectively;

a plurality of horizontal driving sections (3) having horizontal driving communicating sections (8) communicating various control data, and driving to control lighting gradation based on the various control data with selecting the lighting elements of desired columns in a row selected by the vertical driving section (2); and

a driving control section (4) having a first communicating section (5) to communicate the various data with external and a second communicating section (6) connected with a plurality of the horizontal driving sections (3) serially, and controlling the vertical driving section (2) and the horizontal driving sections (3),

wherein:

the second communicating section (6) transfers data packets having a control field (21) including identification information (23), which is the ID to denote the horizontal driving sections (3) to be transferred the various control data, control identification information (24) to denote type of the control data, and an information field (22) including the control data to the horizontal driving sections (3); and

the horizontal driving communicating section (8) receives the control data for the horizontal driving section (3), when the ID of identification information of the transferred data packet (20) agrees with ID stored in itself.

(Amended)

3. The display apparatus according to claims 1 [or 2], wherein

the horizontal driving section (3) stores a common ID to be received

commonly for all of the horizontal sections (3) and the individual ID added individually to each of the horizontal sections (3) as identification information (23) to judge whether to perform a receiving process for the transferred data packet (20).

(Amended)

4. The display apparatus according to any of claims 1-3, wherein

the horizontal driving communicating section (8) has a receiving section (28) performing receiving process and an output selecting circuit (30) outputting the various control data input into the horizontal driving communicating section (8) and data input from the receiving section (28) selectively, outputs the control field (21) of the input data packet (20) transparently from the output selecting circuit (30), and outputs the information field (22) with replacing for a predetermined data packet (20).

5. The display apparatus according to claim 4, wherein:

the predetermined data packet (20) is a disturbance data reading packet (20B) having the identification information (23), the control field (21) including control identification information (24) denoting to read a disturbance data, and the information field (22) including dummy data (22B);

the horizontal driving communicating section (8) further has a disturbance data retaining section (29) retaining the disturbance data its own and outputs the disturbance data retained in the disturbance data retaining section (29) with replacing dummy data included in the control field (22) of the disturbance data reading packet (20B) received in the receiving section (28) of the horizontal driving section (3) with switching the output selecting circuit (30), when the identification information (23) of the data packet (20) received in the receiving section (28) of the horizontal driving section (3) agrees with its own individual ID and has the control identification information (23) denoting control type to read a disturbance data; and

the driving control section (4) reads the disturbance data of the disturbance reading packet (20B) transferred from the horizontal driving section

(3).

6. The display apparatus according to claim 4, wherein:

the predetermined data packet (20) is a communication check packet (20C) having the identification information (23), the control field (21) including control identification information (24) denoting communication check, and the information field (22) including communication check data;

the horizontal driving communicating section (8) further has a data reversing section (38) reversing data of the information field (22);

and outputs data from the data reversing section (38) with replacing communication check data included in the information field (22) of the communication check packet (20C) received in the receiving section (28) of the horizontal driving section (3) with switching the output selecting circuit (30),

when the identification information (23) of the data packet (20) received in the receiving section (28) of the horizontal driving section (3) agrees with its own individual ID and has the control identification information (23) denoting control type of communication check; and

the driving control section (4) performs disturbance check of communication statement based on the data included in the information field (22) of each communication check packet (20C) replied from each horizontal driving section (3) and the communication check data of the communication check packet (20C) transferred to each horizontal driving section (3).

(Amended)

7. The display apparatus according to any of claims 1-6, wherein:

the horizontal driving communicating section (8) of the horizontal driving section (3) can output only in one direction; and

the output data from the horizontal driving communicating section (8) connected at end position of the lowest stream in data transferring direction in a plurality of the horizontal driving position (3) connected serially is input to the second communicating section (6) of the driving control section (4).

(Amended) 8. The display apparatus according to ~~claims~~ claim 1 [or 2], wherein:

the driving control section (4) or the horizontal driving section (3) has a first reference clock generating section (7) generating first reference clock to control lighting gradation; and

the horizontal driving section (3) further has a lighting control section (15) controlling lighting gradation based on reference clock, a second reference clock generating section (19) generating second reference clock synchronizing the various control data input from the driving control section (4), a reference clock selecting circuit (36), which is input the first reference clock and the second reference clock, and selects the first reference clock or the second reference clock alternatively to output as reference clock to control lighting gradation.

9. The display apparatus according to claim 8, wherein:

the horizontal driving section (3) further has a first counter (33) counting input of the first reference clock and generating a clear signal every predetermined count number;

a second counter (34) counting input of the second reference clock until being input the clear signal from the first counter (33); and

the reference clock selecting circuit (36) selects the reference clock from the first reference clock to the second reference clock, when count number of the second counter becomes higher than predetermined value.

(Amended) 10. The display apparatus according to [any of] claims ~~5~~ [1]-~~8~~, wherein:

the horizontal driving section (3) has a third counter (40) counting input of the first reference clock and retaining predetermined data when count number of the input first reference data becomes a predetermined value, and clearing the count number of the first reference clock when the horizontal driving communicating section (8) receives a frame start packet denoting frame synchronizing;

the disturbance data retaining section (29) retains data denoting

occurrence of disturbance of the first reference clock, when count number of the third counter is less than the predetermined value; and

the driving control section (4) reads the data denoting an occurrence of disturbance of the first reference clock by the disturbance data reading packet (20B), controls the reference clock selecting circuit (36) of the horizontal driving section (3) occurring the disturbance to select from the first reference clock to the second reference clock by the data packet (20).

11. The display apparatus according to claim 10, wherein the predetermined value of the count number of the first reference clock is set based on indicating gradation number of one frame.

(Amended)

12. The display apparatus according to [any of] claims 1 [-11], further comprising:

a substrate is integrated with a lighting element board (41) disposing the lighting elements (11) and a driving circuit board (42) having driving circuits (10) driving the lighting elements (11), and

wherein the driving circuits (10) are disposed between the lighting elements.

13. A display apparatus comprising:

a display section (1) disposing a plurality of lighting elements (11);

a vertical driving section (2) driving each row of the display section (1) selectively;

a plurality of horizontal driving sections (3) having horizontal driving communicating sections (8) communicating various control data, driving to control lighting gradation based on the various control data with selecting the lighting elements of desired columns in a row selected by the vertical driving section (2); and

a driving control section (4) having a first communicating section (5) to communicate the various data with external and a second communicating section (6) connected with a plurality of the horizontal driving sections (3)

17. The display apparatus according to claim 15, wherein:

the horizontal driving communicating sections (8) of the horizontal driving section (3) has a receiving section (28) inputting and outputting data, a output selecting circuit (30) outputting data input to the horizontal driving section (3) or the data output from the receiving section (28) selectively;

when setting command to set the ID of the horizontal driving section (3) is input, the horizontal driving communicating sections (8) controls to switch the data output of the output selecting circuit (30) from the data input to the horizontal driving section (3) to the data output through the receiving section (28); and

to store a identifying ID (23a), which is performed the predetermined calculation against the identifying ID (23a) input to the receiving section (28), to horizontal driving side identification information storing section (29) and to the identifying ID performed the predetermined calculation from the output selecting circuit (30).

18. The display apparatus according to claim 15, wherein the horizontal driving communicating sections (8) of the horizontal driving section (3) controls to switch the data output of the output selecting circuit (30) from the data through the receiving section (28) to the data input to the horizontal driving section (3) after outputting the identifying ID (23a) performed the predetermined calculation from the output selecting circuit (30).

19. (Amended) The display apparatus according to [any of claims 13-15], wherein:

the display section is constituted by a plurality of indicating blocks (10) divided into m rows X n columns (m, n are integer and two or more) areas;

the horizontal driving sections (3) are connected from the second communicating section (6) side one after another toward horizontal direction serially; and

the horizontal driving section (3) connected at end column of the lowest stream in each row is connected with the horizontal driving section (3) of

the same column in next row.

(Amended)

20. The display apparatus according to [any of] claims 13 [19], wherein:

the horizontal driving section (3) judges whether to perform a receiving process against the transferred data packets based on the identification information (23) added to the data packets or not, by storing an individual ID (23A), which is added to each horizontal driving section (3) individually, to the horizontal driving side identification information storing section (29); and

the horizontal driving section (3) stores a common ID (23B) to be received by all of the horizontal driving sections (3) commonly.

(Amended)

21. The display apparatus according to [any of] claims 1 [20], wherein a plurality of the lighting elements (11) are disposed in a matrix shape in the display section (1).

(Amended)

22. The display apparatus according to [any of] claims 1 [21], wherein the control data is image data for image-displaying.

(Amended)

23. The display apparatus according to [any of] claims 1 [21], wherein the control data is illuminating data for an illumination.

24. A display driving circuit driving a display apparatus, which has a display section (1) disposing a plurality of lighting elements (11), comprising:

a vertical driving section (2) driving each row of the display section (1) selectively;

a plurality of horizontal driving sections (3) having horizontal driving communicating sections (8) communicating lighting data for lightening the lighting elements, performing light-driving based on the lighting data with selecting the lighting elements of desired columns in a row selected by the vertical driving section (2); and

a driving control section (4) having a first communicating section (5) to